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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/606,437	06/25/2003	Leping Huang	088245-0113	6335

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EXAMINER	
NG, CHRISTINE Y	
ART UNIT	**PAPER NUMBER**
2416	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/606,437	HUANG, LEPING	
	Examiner	Art Unit	
	CHRISTINE NG	2416	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 February 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *36-65* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *36-39,42,48-54,57,59-61 and 64* is/are rejected.

7)☒ Claim(s) *40,41,43-47,55,56,58,62,63 and 65* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 June 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 36-39, 42, 48-54, 57, 59-61 and 64 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 36-39, 42, 48, 49, 51-54, 57, 59, 60, 61 and 64 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Publication No. 2003/0202468 to Cain et al in view of U.S. Publication No. 2003/0202477 to Zhen et al.

Referring to claims 36, 51 and 59, Cain et al disclose a method of selecting a route for communicating information in a communication network, the method comprising:

Calculating (Figure 7, blocks 72 and 73) a connectivity metric (QoS metrics) for a plurality of links defining each of a plurality of routes that connect a start node (Figure 9, node 214) with an end node (Figure 9, node 215), each link of the plurality of links including a first node and a second node, wherein the first node is a first type of node selected from a first master node (Figure 9, nodes 221-233), a first slave node (Figure 9, nodes 211), and a first multiple network participant node (none), wherein the second node is a second type of node selected from a second master node (Figure 9, nodes

221-233), a second slave node (Figure 9, nodes 211), and a second multiple network participant node (none).

Determining (Figure 7, blocks 74 and 75) a total connectivity metric for each of the plurality of routes based on the calculated connectivity metric for the plurality of links defining each of the plurality of routes.

Selecting (Figure 7, block 76) a route in a communication network for communicating information between the start node and the end node from the plurality of routes based on the determined total connectivity. A plurality of potential routes between start node 214 and end node 215 is determined, and for each potential route, QoS metrics are calculated. As shown in Table 1 (Section 0048), QoS metrics include estimated link delay, available link capacity, etc. The QoS metrics for all routes is calculated and the route with the best QoS metrics is chosen. Refer to Sections 0054-0062.

Cain et al do not disclose wherein the calculated connectivity metric for a link of the plurality of links is determined based on the first type of node and the second type of node.

Zhen et al disclose a method in Figures 3 and 6 of determining a best route in a Bluetooth network. A source node broadcasts a RREQ message to connect to neighboring nodes and becomes the master node; any new node replying to the RREQ message becomes a slave node. Thereafter, if the master node is found by a second master node, the master node becomes an M-S joint node in the piconet of the second master node. If the slave node finds a subsequent node along a path, the slave node

becomes an S-S joint node. Refer to Sections 0015-0017, 0042, 0072-0085 and 0103-0122. In the path discovery process, it is "very important to determine when, and which node becomes the master or the slave, or which type of joint node exists on the route between the source and the destination" (Section 0042, lines 16-18). In determining the best path, it is better to use a path with less joint nodes because if a network is formed using the minimum number of piconets, inter-piconet interference, packet scheduling with adjacent piconets and inter-packet collision decreases. This results in easier network maintenance, cheaper costs, broader bandwidth and less battery power consumption. Refer to Sections 0048, 0052 and 0135. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include wherein the calculated connectivity metric for a link of the plurality of links is determined based on the first type of node and the second type of node. One would have been motivated to do so since the node type affects how many piconets are crossed in a particular path, which affects network performance.

Referring to claims 37, 38, 52, 53 and 60, Cain et al do not disclose wherein, if the first/second node is the first/second master node in a sub-network of the communication network and the second/first node is the second/first slave node in the sub-network, the connectivity metric is a number of slave nodes in the sub-network.

Zhen et al disclose that a master node searches for slave nodes until N (N>= 7) slave nodes are found. Refer to Sections 0078, 0079 and 0115. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include wherein, if the first/second node is the first/second master node in a sub-

network of the communication network and the second/first node is the second/first slave node in the sub-network, the connectivity metric is a number of slave nodes in the sub-network. One would have been motivated to do so since the number of slave nodes affects how many paths can be found to reach a destination.

Referring to claims 39, 54 and 61, Cain et al do not disclose wherein the first multiple network participant node comprises a first master multiple network participant node and a first slave multiple network participant node wherein the first master multiple network participant node participates in a sub-network of the communication network as a master node, and further wherein the first slave multiple network participant node does not participate in the communication network as a master node.

Zhen et al disclose that a joint node is a node serving as a member in at least two piconets. An M-S joint node is a joint node that serves as a slave in one piconet and as a master in another piconet. An S-S joint node is a joint node serving as a slave in both piconets. Refer to Section 0060-0062. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include wherein the first multiple network participant node comprises a first master multiple network participant node and a first slave multiple network participant node wherein the first master multiple network participant node participates in a sub-network of the communication network as a master node, and further wherein the first slave multiple network participant node does not participate in the communication network as a master node. One would have been motivated to do so since ad hoc networks include

Participants in Multiple Piconets (PMP) nodes that are masters in one piconet but are slaves in another piconet.

Referring to claims 42, 57 and 64, Cain et al disclose wherein determining the total connectivity metric of a route of the plurality of routes comprises identifying a maximum connectivity metric of the plurality of links defining the route. Based on the parameters of Table 1 (Section 0048), the QoS metrics is calculated for each potential route. Each node metric form is given by $m_N=(C_{N1}, C_{N2}, C_{N3},...)$ where C_{Ni} is the i^{th} component of the node metric vector, and a link metric form is given by $m_L=(C_{L1}, C_{L2}, C_{L3},\ldots)$ wherein C_{Li} is the i^{th} component of the link metric vector. A raw path metric with the node metric vector and the link metric vector is given by $m_P=(m_{L1}, m_{N2}, m_{L2},\ldots, m_{L(k-1)}, m_{Nk}, m_{Lk})$. Link and node metric weight vectors are then added to the vector m_P to emphasize certain components. Although not specifically disclosed, this process involves identifying a maximum connectivity metric of the plurality of links since after adding the weighting value to each link/node metric, the system can put more emphasis on certain metrics and identify the maximum metric. Refer to Sections 0053-0054.

Referring to claim 48, Cain et al disclose that the method further comprises communicating the calculated connectivity metric to a node of the communication network. The QoS metrics of all potential routes must be communicated to one another in order to compare them and find the best route, such as through HELLO messages. Refer to Sections 0057-0062 and 0079.

Referring to claim 49, Cain et al disclose that communicating the calculated connectivity metric comprises inserting the calculated connectivity metric into a routing

protocol packet (HELLO messages). Nodes 211 broadcast and listen for HELLO messages, which are sent to and from other nodes 211 to communicate path metric information. Refer to Section 0079.

4. Claim 50 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Publication No. 2003/0202468 to Cain et al in view of U.S. Publication No. 2003/0202477 to Zhen et al, and in further view of U.S. Publication No. 2005/0226265 to Takatori.

Cain et al disclose do not disclose wherein the calculated connectivity metric is inserted into the routing protocol packet in place of a hop number.

Takatori discloses in Figures 20 and 21 a method for determining potential paths between stations in a network. Packets, transmitted between stations which advertise the potential paths, indicate the path costs of paths instead of the hop count of paths. Refer to Sections 0104-0110. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include. One would have been motivated to do so in order to take into account other factors besides hop count when determining the optimal path.

Allowable Subject Matter

5. Claims 40, 41, 43-47, 55, 56, 58, 62, 63 and 65 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTINE NG whose telephone number is (571)272-3124. The examiner can normally be reached on M-F; 8:00 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Ngo can be reached on (571) 272-3139. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

C. Ng
March 6, 2009

/Ricky Ngo/
Supervisory Patent Examiner, Art Unit 2416